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# Are abnormal accruals values relevant? Evidence from Sub-Saharan Africa

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**Abstract:** This study examines whether the market values abnormal accruals differently in Sub-Saharan Africa. Abnormal accruals signal managers' valuations of a firm. Alternatively, abnormal accruals are opportunistic and, therefore, misrepresent the value of the firm. We use panel data from listed firms in securities markets in South Africa, Nigeria, and East Africa for the period 2006–2020 collected from annual reports and financial market databases. Ohlson's (1995) price model is used as the basis for regression analysis to measure value relevance. We find that abnormal accruals are value-irrelevant and thus discounted by the market. Rational investors perceive abnormal accruals to represent managers' opportunistic actions. This study contributes to the literature on the value relevance of accounting information and market-based accounting research on African markets.

**Keywords:** value relevance; abnormal accruals; financial markets; Africa.

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## 1 Introduction

The impact of financial statement information on capital markets is an enduring area of study (Barth et al., 2023; Dunham and Grandstaff, 2021). Investors use value-relevant accounting information for decision making (Mulenga and Bhatia, 2020; Adeyemo et al., 2016; Saccon and Dima, 2015). Value relevance is based on the principle that if information is useful, investors will adjust their behaviour, and the market will respond through changes in stock prices[1] (Francis et al., 2004; Barth et al., 2001; Kothari, 2001).

There is differing evidence on the value relevance of accounting information (Dunham and Grandstaff, 2021). Most value-relevance studies have focused on earnings, cash flows, and accruals as a whole, providing more robust results than those that show interest in abnormal accruals (Abdelrahim Ahmad Khader and Shareif Hussein Shanak, 2023; Clinch et al., 2012).

Dunham and Grandstaff (2021) argue that there is mixed evidence on the value relevance of abnormal accruals. Evidence shows that abnormal accruals contain private information for management to convey to market participants (Menicucci, 2020; Kolsi and Attayah, 2017; Ling-Yan, 2015; Subramanyam, 1996). Therefore, abnormal accruals should signal relevant information necessary for market valuation (Dimitropoulos and Asteriou, 2009; DeFond and Park, 2001).

On the other hand, managers aggressively take advantage of accounting discretion to opportunistically manage reported earnings (Bansal, 2004; Francis et al., 2005). Abnormal accruals are susceptible to manipulation by opportunistic managers (Bansal, 2004; Jamadar et al., 2022). Hence, the market discounts abnormal accruals (Akileng and Donnelly, 2013). Similarly, investors are not motivated to make decisions based on abnormal accruals (Kumar, and Krishnan, 2008). This situation has worsened due to accrual mispricing (Sun, 2020; Sloan, 1996). This means that abnormal accruals are not good indicators of stock prices or firm value (DuCharme et al., 2004; Louis, 2004).

We also argue that the value relevance of abnormal accruals remains conflicting and unresolved. Moreover, the existing evidence is from developed countries with robust financial markets, strong regulations, and effective financial reporting systems. Therefore, this study is unique in that it examines the value relevance of abnormal accruals from the perspective of developing markets. Thus, we contribute to the existing literature by addressing the impact of abnormal accruals on both pricing and firm valuation in the Sub-Saharan African capital markets.[2]

We collected data from annual reports and financial market databases from a sample of listed firms in Sub-Saharan Africa. We analyse the relationship between share price or firm market value and earnings comprising cash flows, normal accruals and abnormal accruals. This confirms whether investors value abnormal accruals compared with other earnings presented in financial statements.

The remainder of the paper is organised as follows. Section 2 presents a review of the literature on value relevance and earnings quality and the relationship between market

price and abnormal accruals, which guided the development of the study hypotheses. This section is followed by the methodology in Section 3. Section 4 presents and discusses the findings, and Section 5 provides a summary and conclusion of the study.

## 2 Literature review and hypothesis development

### *2.1 Theoretical foundation*

The value of information matters as it can be prone to manipulation leading to a financial crisis (Smithers, 2022). Thus, this study is based on the random walk theory and agency theory. Investor reactions to accounting information quality are affected by both stock market efficiency and information asymmetry. As the market adjusts and interprets news, this information creates uncertainty that affects the volatility of prices and returns. New information can lead to information asymmetry, leading to increased price volatility.

#### *2.1.1 Random walk theory*

This theory suggests that changes in stock prices have the same distribution and are independent of each other (Brealey et al., 2005). It claims that stocks take a random and unpredictable path that makes all methods of predicting stock prices futile in the long run (Shah et al., 2019; Fama, 1965). Price changes reflect the average change in investors' beliefs about announcements (Masood et al., 2023; Ball and Brown, 1968; Beaver, 1968).

The degree of responsiveness of stock price changes to changes in accounting information depends on market efficiency (Baumol, 1965; Fama, 1970). The efficient market hypothesis states that stock prices fully reflect all available information and expectations; thus, current prices are the best approximation of a company's core value (Naseer and Bin Tariq, 2015). This prevents the constant exploitation of mispriced stocks because price movements are mostly random and driven by unexpected events (Malkiel, 1973). The strong-form efficient market hypothesis states that all information is completely accounted for in current stock prices, and no additional information that can give an investor an advantage in the market. However, this is not easily achieved in developing and emerging markets (Bankoti, 2017; Fama, 1970).

Investment depends on market efficiency; therefore, value relevance changes based on the response of investors to all the information presented (Umoru et al., 2020; Lako, 2007; Beaver, 1968). New information can lead to information asymmetry reducing its quality, value relevance and market efficiency, causing mispriced shares (Ehiedu and Obi, 2022). The higher the information quality, the more rational investors are, thus creating successful market efficiency and increased value relevance (Smithers, 2022; Ball and Brown, 1968).

#### *2.1.2 Agency theory*

This theory is concerned with resolving conflicts and subsequently aligning the interests of the principal and the agent (Jensen and Meckling, 2019, 1976). Firms' market value, earnings, and dividends depend on managers' effectiveness. However, managers also want to maximise their own wealth, even if they have to achieve this objective to the detriment of shareholders (Jensen, 1986). Managers might decide to overstate the

numbers in financial statements through their accounting standards (Watts and Zimmerman, 1986).

Theoretical issues arise from poor separation of ownership and control (Saeed and Sameer, 2017). It provides the potential for financial reporting concerns to arise due to agency conflicts and the resulting information asymmetry (Kim and Yi, 2006; Watts and Zimmerman, 1990). Information asymmetry enables managers to use discretionary accounting, thereby creating distortions in reported accounting earnings (Dechow et al., 1995; Watts and Zimmerman, 1986). High information asymmetries also reduce the value relevance of abnormal accruals (Choi et al., 2011).

Hence, proper disclosure of accounting information and financial reporting plays a significant role in alleviating information asymmetry and moral hazard (Amihud and Mendelson, 1986). It is a prerequisite for efficient stock markets in which stock prices reflect all information and communicate that information to managers and investors (Ball and Brown, 2019).

## *2.2 Related literature and hypothesis development*

Many studies use the abnormal component as a proxy for earnings management (Costa and Soares, 2022; Jamadar et al., 2022; Dechow et al., 1995). Here, abnormal accruals erode decision usefulness and result in lower earnings quality (Park et al., 2021).

### *2.2.1 Value relevance of abnormal accruals*

Value-relevance research is based on the idea that accounting information is useful for determining firm value when its change corresponds to the variation in stock prices (Ball and Brown, 2019; Saccon and Dima, 2015; Barth et al., 2001). In an efficient market hypothesis, stock prices must reflect market participants' preferences (Beaver, 1968). However, the existence of an efficient market does not necessarily imply value relevance (Smithers, 2022). This is because of a lack of trust in earnings due to manipulation, mainly in emerging markets.

The value relevance of operating cash flows and normal accruals does not differ between firms, whereas that of abnormal accruals does vary. Operating cash flows and normal accruals are easier to verify and, thus, less susceptible to integrity concerns (Dharmayuni et al., 2024; Marquardt and Wiedman, 2005; Krishnan, 2003). Accruals especially those with poor representation are less persistent than cash flows (Abousamak, 2018), and abnormal accruals are less consistent than normal accruals (Pimentel and Malacrida, 2020; Xie, 2001).

In certain situations, rational investors are afraid to base their decisions on accounting information (Smithers, 2022). Thus, it is important for more value-relevance studies, especially those that show interest in abnormal accruals (Klimczak, 2009). There is no consensus as to whether abnormal accruals improve (signal) or distort (opportunistic earnings management) the information value of earnings (Subramanyam, 1996; Watts and Zimmerman, 1986).[3] An efficient market should value abnormal accruals effectively if they signal future financial performance (Dimitropoulos and Asteriou, 2009; Louis and Robinson, 2005; Subramanyam, 1996). Higher levels of positive abnormal accruals are associated with higher earnings quality, as opposed to being an opportunistic earnings management tool (Ozili, 2021; Pham et al., 2019; Abousamak, 2018).

However, accrual accounting is also subject to earnings management which reduces their value relevance (Al-Shattarat, 2021; Mostafa, 2017). Studies have found that firms with past evidence of earnings management negatively price abnormal accruals (Pham et al., 2019). The consistent mis-valuation of earnings upsets investors' interests and impedes the development of successful capital markets (Chen et al., 2010).

Emerging markets generally experience higher earnings management than developed markets (Leuz et al., 2003). Pincus et al. (2007) find that accounting earnings are overvalued in developed markets but undervalued in emerging markets. While the valuation of earnings has been extensively investigated in developed economies, little attempt has been made to explain the undervaluation of accounting earnings and the misevaluation of abnormal accruals in emerging markets (Barth et al., 2023; Chen et al., 2010).

Regardless of the underlying reason for abnormal accruals, investors usually downgrade the information content of reported earnings when they face a higher possibility of earnings management (Al-Shattarat, 2021; Mostafa, 2017; Chen et al., 2010). Accruals represent a means of manipulating reported earnings. This misleads the market in that it inefficiently prices value-irrelevant abnormal accruals and unintentionally rewards firms involved in earnings management (Martins et al., 2021; Botsari, 2020). Moreover, Akileng and Donnelly (2013) argue that abnormal accruals are value-irrelevant and should therefore be discounted by the market.

Therefore, we hypothesise that;

$H_1$ Abnormal accruals are value relevant.

$H_2$ Abnormal accruals are value irrelevant.

## 3 Methodology

### *3.1 Sample size and data sources, inclusion and exclusion criteria*

This study focuses on listed firms in the securities markets in East Africa, Nigeria, and South Africa.

We eliminated firms listed after 2019 because they provided no financial data for previous years. Firms suspended or delisted during the study period were excluded to avoid missing data. Commercial banks and firms that offer banking services are eliminated because their financial results are not based on firm performance, but on financial transfers. These firms are also subject to different reporting rules and regulations (Elvin and Hamid, 2016). Firms with losses are eliminated due to uncertainty, and risk losses result in investments. Losses usually reduce demand and the market prices of firms, and investors will only be attracted to shares supported by earnings (Busari and Bagudo, 2021). After the exclusion of those firms, the total number of firms used in this study across the five years is.

**Table 1** Sources of data collected

| *Data types* | *Data specifics* | *Data extracted* | *Data sources* |
|---|---|---|---|
| Stock market data | Historical data | Share prices | Investing.com (African Stock Market), Simply wall Street |
| Financial Accounting Data | Statement of financial position | AR, PPE and TA | Barron's, Market Screener, Market Watch, WSJ (Wall Street Journal) Markets |
| | Statement of profit or loss | REV, PAT and EPS | |
| | Statement of cash flows | Cash flows | |
| | | ROA | |
| Justification | *The Modified-Jones model (1995)* | | |
| Derive abnormal accruals | $TA_{it}/A_{it-1} = \propto_i \left(1/A_{it-1}\right) + \beta_{1i}\left(\Delta REV_{it} - \Delta AR_{it}/A_{it-1}\right) + \beta_{2i}\left(PPE_{it}/A_{it-1}\right) + \varepsilon_{it}$ | | |
| | *Model of Kothari et al (2005)* | | |
| | $TA_{it}/A_{it-1} = \propto_i \left(1/A_{it-1}\right) + \beta_{1i}\left(\Delta REV_{it} - \Delta AR_{it}/A_{it-1}\right) + \beta_{2i}\left(PPE_{it}/A_{it-1}\right) + \delta_1 ROA_{i,t-1}$ | | |
| | where: | | |
| | *AR* = Accounts receivable | *A* = Total assets | |
| | *REV* = Revenues | *PPE* = Property, plant and equipment | |
| | *ROA* = Return on assets | | |

**Table 2** Listed firms per region before exclusion

| | *Years* | | | | | *Total* |
|---|---|---|---|---|---|---|
| | *2019* | *2020* | *2021* | *2022* | *2023* | |
| South Africa | 303 | 294 | 289 | 274 | 264 | *1,424* |
| Nigeria | 169 | 166 | 164 | 180 | 177 | *856* |
| East Africa | 98 | 96 | 93 | 91 | 91 | *469* |
| *Total* | *570* | *556* | *546* | *545* | *532* | *2,749* |

Note: Number of listed firms in South Africa, Nigeria and East Africa across five years.

**Table 3** Listed firms per region after exclusion

| | *Years* | | | | | *Total* |
|---|---|---|---|---|---|---|
| | *2019* | *20120* | *2021* | *2022* | *2023* | |
| South Africa | 215 | 206 | 198 | 190 | 144 | *953* |
| Nigeria | 72 | 79 | 72 | 81 | 73 | *377* |
| East Africa | 38 | 36 | 36 | 34 | 31 | *175* |
| *Total* | *325* | *321* | *306* | *305* | *248* | *1,505* |

Note: Number of listed firms in South Africa, Nigeria and East Africa across five years.

## *3.2 Methodological issues of models*

### *3.2.1 Measures of abnormal accruals*

Earnings quality measures focus on accruals (Acar and Coskun, 2023). One common approach splits total accruals into normal and abnormal accruals (Jones, 1991). The reason is that accruals are likely to be the result of managerial discretion and the firm's economic environment. In this study we use abnormal accruals from the modified Jones model (Dechow et al., 1995), in the primary models and Kothari et al. (2005) model for robustness tests.

### *3.2.2 Ohlson price versus returns model*

The price $P_t = \propto_0 + \propto_1 E_t + \varepsilon_{it}$ and return $R_t = \propto_0 + \propto_1 E_t + \varepsilon_{it}$ models rely on the hypothesis that current earnings contain information about expected future net cash flows (Ohlson, 1991; Beaver et al., 1989; Watts and Zimmerman, 1986). However, both have weaknesses that yield inconsistent results (Ota, 2003). The price model is the theoretical foundation for many studies on price-to-earnings. The price model yields an unbiased earnings response coefficient when prices lead earnings compared to the returns model (Ramakrishnan and Thomas, 1998). The returns model does not yield econometric or heteroscedastic issues associated with the price model (Akileng, 2013). Despite this criticism, price models have persisted (Wang, 2021; Lee et al, 2014). Therefore, we attach preference to the price model because it is less biased and provides a fair picture of the relationships between share prices, earnings, and its components.

### *3.2.3 Tobin's Q ratio*

The Q Ratio is a popular method for estimating the fair value of the stock market. The extensive literature uses Tobin's Q as a proxy for firm value (Fu et al., 2016). Tobin's Q reflects the valuation placed on a firm's assets by the market (Smith, 2008). This measure of stock valuation is the driving factor behind investment decisions. The higher the value of Tobin's Q, the greater the investment opportunities (Blose and Shieh, 1997). Its major limitation is that it has four methods of measurement and $R^2$ can be stubbornly low in value relevance studies, as shown in the regression results (Hutagaol-Martowidjojo et al., 2019). Results exist with low adjusted $R^2$ and statistically significant variables. A large sample size can lead to a low R-squared, and the Q ratio is still surrounded by uncertainty impacting the adjusted $R^2$ (Blose and Shieh, 1997). This leads to low explanatory power. However, the study's main interest was to understand the relationship between variables. Low $R^2$ is acceptable if results exhibit significant relationships between variables. Finally, the results were applicable when explaining the relationships (Ozili, 2023; Frost, 2019).

Tobin's Q minimises standard errors and is still used in practice; therefore, we use the Q ratio, a proxy for firm market value, as the dependent variable for the second model.

## 3.3 Measurement and operationalisation of study variables

### 3.3.1 Variables' definitions and measurements

This study used two main dependent variables: stock price and Tobin's Q ratio. Abnormal accruals are the main predictor of cash flow earnings and normal accruals are the main controls. We also control for firm size, leverage, earnings persistence, and book-to-market ratio.

**Table 4** Summary of description and measurement of variables

| *Variables* | *Measurement* |
|---|---|
| Price (P) | The stock price is the adjusted closing price of shares at the end of the financial year. |
| Tobin's Q ratio (Q) | A popular method of estimating the fair value of the stock market developed by Nobel Laureate James Tobin. $Q ratio = \frac{Market\ Value}{Asset\ Rweplacement\ Cost(Total\ Assets)}$. |
| Earnings (E) | Profit after taxation extracted from the profit and loss statement |
| Cash flows (CF) | Net cash flows extracted from the cash flow statement |
| Normal accruals (NDA) | Derived from subtracting derived abnormal accruals from total accruals |
| Abnormal accruals (DA) | Residuals derived from the regression of the modified Jones model (Jones, 1995) |
| Firm size | The natural logarithm of total assets at the end of the year is used as the proxy of firm size (Arosa et al., 2010) |
| Leverage | Leverage is used to measure the debt covenant motivation for earnings management. Leverage is defined as total debt/liabilities scaled by total assets used to investors to check company solvency. |
| Persistence | Earnings persistence measures the extent to which current earnings persist or recur in the future. Higher coefficient estimates reflect more persistence in earnings. Persistence uses the following model: $E_{i,t} = B_{0,i} + \beta_1 E_{i,t-1} + \varepsilon_{i,t}$ |
| Book to market ratio (BM) | The ratio of book value to market value. The book-to-market ratio identifies undervalued or overvalued securities and determines the market value of a company relative to its actual worth. |

## 3.4 Model specification

The random-effects model was used for the panel data regression analysis. This is because; due to the elimination of firms across years, there is no fixed population, the study contains random variables, and we also want to eliminate external effects on price and Tobin's Q (Hill et al., 2018). The model is estimated via generalised least squares (GLS); as such, random effects estimates will generally have smaller variances (Field, 2001). The GLS estimator results are similar to those of the simple OLS regression output and fixed-effects estimator (Mundlak, 1978). Therefore, the random-effects GLS model was more efficient in this study.

This study employs Ohlson's (1995) price regression model, which shows that accounting information is related to price and decision-making (Wang et al., 2008).

Using the Ohlson (1995) price model;

$$P_{it} = \propto_0 + \propto_1 E_{it} + \varepsilon_{it} \quad (1)$$

where:

$P$ share price

$E$ earnings

$\varepsilon_{it}$ error term in year $t$ for firm $i$.

$$\begin{aligned} P_{it} &= \propto_0 + \propto_1 E_{it} + \propto_2 Firm\ size_{it} + \propto_3 Leverage_{it} \\ &\quad + \propto_4 Persistence_{it} + \propto_5 B:M_{it} + \varepsilon_{it} \\ E &= \beta_0 + \beta_1 CF_{it} i + \beta_2 Ac_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

where:

$CF$ cash flows

$Ac$ accruals

$Accruals$ = Normal accruals+ Abnormal accruals.

To increase explanatory power and minimise the impact of other variables that could interfere with the results, four control variables were included.

Therefore:

$$\begin{aligned} P_{it} &= \propto_0 + \propto_1 CF_{it} + \propto_2 NDA_{it} + \propto_3 DA_{it} + \propto_4 Firm\ size_{it} \\ &\quad + \propto_5 Leverage_{it} + \propto_6 Persistence_{it} + \propto_7 BM_{it} + \varepsilon_{it} \end{aligned} \quad \text{(Model 1)}$$

where:

$NDA$ normal accruals

$DA$ abnormal accruals

$BM$ book to market ratio.

The second model replaces price with Tobin's Q ratio.

$$\begin{aligned} Q_{it} &= \propto_0 + \propto_1 CF_{it} + \propto_2 NDA_{it} + \propto_3 DA_{it} + \propto_4 Firm\ size_{it} \\ &\quad + \propto_5 Leverage_{it} + \propto_6 Persistence_{it} + \propto_7 B:M_{it} + \varepsilon_{it} \end{aligned} \quad \text{(Model 2)}$$

## 4 Empirical results and discussion

### *4.1 Descriptive statistics*

Table 5 presents the results for the descriptive statistics. On average, abnormal accruals in Nigeria (–0.323) and East Africa (–1.97) are negative. This implies that firms in these markets use income-decreasing earnings management, which is less subject to public scrutiny and criticism in capital markets. However, on average, abnormal accruals in South Africa (0.209) were positive. This implies that South African firms engage in income-increasing accrual management. The average Q ratios are all above one (1.47, 2.05, and 1.20), showing that these listed firms are generally valued more highly in the

market than the recorded total assets, leading to increased interest by investors (Lang et al., 1989).

**Table 5** Descriptive statistics for listed firms in South Africa, Nigeria and East Africa

| *South Africa* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Variables* | *Obs* | *Mean* | *Std. Dev.* | *Min* | *Max* | *Pr(Skewness)* | *Pr(Kurtosis)* |
| P | 953 | 5,139.88 | 7,463.59 | 57.8 | 27,788 | 0.0620 | 0.0780 |
| Q | 953 | 1.47 | 3.16 | 0 | 26.88 | 0.0800 | 0.1100 |
| CF | 953 | 1,765.90 | 1,422.95 | 0.047 | 11,081 | 0.1662 | 0.4400 |
| NDA | 953 | 64.29 | 18.06 | 0.78 | 155.64 | 0.0935 | 0.0879 |
| DA | 953 | 0.209 | 12.93 | –0.631 | 34.57 | 0.0991 | 0.0894 |
| Firm size | 947 | 8.15 | 2.11 | 2.21 | 12.22 | 0.0852 | 0.2363 |
| Leverage | 953 | 0.398 | 0.236 | 0 | 2.803 | 0.0530 | 0.0482 |
| Persistence | 953 | 0.669 | 0.125 | –2.36 | 0.95 | 0.0555 | 0.0610 |
| BM | 953 | 0.022 | 0.066 | –0.054 | 0.708 | 0.0574 | 0.0701 |
| *Nigeria* | | | | | | | |
| *Variables* | *Obs* | *Mean* | *Std. Dev.* | *Min* | *Max* | *Pr(Skewness)* | *Pr(Kurtosis)* |
| P | 377 | 22.41 | 43.55 | 0.21 | 172.15 | 0.1330 | 0.1400 |
| Q | 377 | 2.05 | 1.36 | 0.003 | 19.62 | 0.2010 | 0.1303 |
| CF | 377 | 5.184 | 32.04 | 0 | 314.17 | 0.1962 | 0.2663 |
| NDA | 377 | 0.087 | 0.424 | –1.01 | 2.659 | 0.1114 | 0.0860 |
| DA | 377 | –0.323 | 0.555 | –4.93 | –0.127 | 0.1120 | 0.0910 |
| Firm size | 375 | 9.99 | 1.78 | 4.05 | 14.52 | 0.5636 | 0.2975 |
| Leverage | 377 | 0.682 | 2.37 | 0 | 36.69 | 0.0500 | 0.1635 |
| Persistence | 377 | 0.092 | 0.009 | 0.067 | 0.2 | 0.1610 | 0.0967 |
| BM | 375 | 3.761 | 37.16 | –376.75 | 539.02 | 0.1090 | 0.1423 |
| *East Africa* | | | | | | | |
| *Variables* | *Obs* | *Mean* | *Std. Dev.* | *Min* | *Max* | *Pr(Skewness)* | *Pr(Kurtosis)* |
| P | 175 | 367.16 | 624.87 | 2.807 | 2,305 | 0.1650 | 0.2047 |
| Q | 175 | 1.20 | 1.69 | 0 | 11.62 | 0.1852 | 0.1803 |
| CF | 175 | 9.403 | 41.13 | 0.023 | 276.79 | 0.2007 | 0.0963 |
| NDA | 175 | 2.19 | 5.27 | 0.300 | 36.09 | 0.0965 | 0.1520 |
| DA | 175 | –1.97 | 2.41 | –0.926 | 14.00 | 0.0944 | 0.1250 |
| Firm size | 175 | 10.44 | 2.09 | 5.54 | 14.80 | 0.1030 | 0.2316 |
| Leverage | 174 | 0.348 | 0.247 | 0 | 0.89 | 0.1008 | 0.1007 |
| Persistence | 175 | 1.57 | 1.49 | 0.844 | 8.85 | 0.1040 | 0.2200 |
| BM | 175 | 1.95 | 2.26 | 0 | 14.14 | 0.1860 | 01010 |

Notes: P is the share price. Q is the Tobin's Q ratio. Leverage is measured by the ratio of total debt to assets. CF is the operating cashflows. Persistence of earnings (Persistence) is measured from regressing future earnings on current earnings. BM is the book to market ratio. DA are abnormal accruals and NDA are normal accruals. Pr(Skewness and Kurtosis) measure normality and distribution of data.

**Table 6** Pairwise correlations modified Jones model – South Africa, Nigeria and East Africa

| | | | | | *South Africa* | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Variables* | | *P* | *Q* | *CF* | *NDA* | *DA* | *Firm size* | *Leverage* | *Persistence* | *BM* |
| (1) | P | 1.000 | | | | | | | | |
| (2) | Q | 0.429*** | 1.000 | | | | | | | |
| (3) | CF | 0.320*** | 0.097* | 1.000 | | | | | | |
| (4) | NDA | 0.192*** | 0.223*** | –0.716*** | 1.000 | | | | | |
| (5) | DA | –0.130** | –0.184** | –0.010** | –0.005* | 1.000 | | | | |
| (6) | Firm size | 0.528*** | 0.090 | 0.409*** | –0.413*** | 0.022* | 1.000 | | | |
| (7) | Leverage | –0.077** | –0.040 | 0.294*** | –0.151*** | 0.133*** | 0.308*** | 1.000 | | |
| (8) | Persistence | –0.313*** | 0.164** | –0.273*** | 0.123*** | 0.029* | –0.240*** | 0.062* | 1.000 | |
| (9) | BM | –0.116*** | –0.422*** | 0.063* | 0.060* | –0.041*** | –0.094*** | –0.307*** | –0.039* | 1.000 |
| | | | | | *Nigeria* | | | | | |
| *Variables* | | *P* | *Q* | *CF* | *NDA* | *DA* | *Firm size* | *Leverage* | *Persistence* | *BM* |
| (1) | P | 1.000 | | | | | | | | |
| (2) | Q | 0.348*** | 1.000 | | | | | | | |
| (3) | CF | 0.464*** | 0.396*** | 1.000 | | | | | | |
| (4) | NDA | 0.228*** | 0.107** | –0.197*** | 1.000 | | | | | |
| (5) | DA | –0.094** | –0.164*** | –0.999*** | –0.195*** | 1.000 | | | | |
| (6) | Firm size | 0.370*** | –0.016 | 0.513*** | –0.453*** | –0.510*** | 1.000 | | | |
| (7) | Leverage | –0.006* | 0.145*** | –0.007* | –0.575*** | 0.007* | –0.306*** | 1.000 | | |
| (8) | Persistence | 0.123** | –0.009 | 0.076* | –0.194*** | –0.075 | –0.078 | 0.420*** | 1.000 | |
| (9) | BM | –0.043* | –0.125*** | 0.085* | 0.044* | –0.085* | 0.084* | –0.020 | –0.003* | 1.000 |
| | | | | | *East Africa* | | | | | |
| *Variables* | | *P* | *Q* | *CF* | *NDA* | *DA* | *Firm size* | *Leverage* | *Persistence* | *BM* |
| (1) | P | 1.000 | | | | | | | | |
| (2) | Q | 0.326*** | 1.000 | | | | | | | |
| (3) | CF | 0.742*** | 0.122* | 1.000 | | | | | | |
| (4) | NDA | 0.526*** | 0.180** | –0.590*** | 1.000 | | | | | |
| (5) | DA | –0.528*** | –0.192** | –0.568*** | 0.992*** | 1.000 | | | | |
| (6) | Firm size | 0.630*** | –0.158*** | 0.736*** | –0.484*** | –0.472*** | 1.000 | | | |
| (7) | Leverage | –0.127* | 0.104** | 0.294*** | –0.181** | –0.169** | 0.241*** | 1.000 | | |
| (8) | Persistence | 0.744*** | –0.067 | 0.860*** | –0.401*** | –0.374*** | 0.664*** | 0.237*** | 1.000 | |
| (9) | BM | –0.306*** | –0.085* | –0.187** | 0.139* | –0.138* | 0.072 | –0.151** | –0.197*** | 1.000 |

Notes: Correlation significance represented by; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Where: P is the share price; Q is the Tobin's Q ratio. Leverage is measured by the ratio of total debt to assets. CF are the operating cash flows. Persistence of earnings (Persistence) is measured from regressing future earnings on current earnings. BM is the book to market ratio. DA are abnormal accruals derived from the modified Jones model and NDA are normal accruals using the modified Jones model. DA are derived from extraction of residuals after model regression analysis and NDA are; total accruals – DA.

**Table 7** Regression for South African, Nigerian and East African listed firms (share price)

| | *South Africa* | | | *Nigeria* | | | *East Africa* | | |
|---|---|---|---|---|---|---|---|---|---|
| *Variables* | *Coefficient* | *T values* | *P values* | *Coefficient* | *T values* | *P values* | *Coefficient* | *T values* | *P values* |
| CF | 0.00171 | 9.50 | 0.000 | 0.000317 | 6.15 | 0.000 | 0.00221 | 3.23 | 0.004 |
| | (0.0000364) | | | (0.0000519) | | | (0.000743) | | |
| NDA | 0.00218 | 4.48 | 0.000 | 2.767 | 3.74 | 0.000 | 8.776 | 2.21 | 0.029 |
| | (0.0000487) | | | (0.7266) | | | (0.8658) | | |
| DA | *–0.185* | *2.96* | 0.003 | *–2.417* | *–2.43* | *0.016* | *–9.578* | *–2.43* | *0.016* |
| | *(0.0030)* | | | *(0.8593)* | | | *(1.085)* | | |
| Firm size | 6.122 | 13.47 | 0.000 | 5.014 | 3.39 | 0.001 | 4.275 | 3.38 | 0.000 |
| | (0.0294) | | | (1.475) | | | (0.2607) | | |
| Leverage | –0.326 | –1.99 | 0.047 | –0.609 | –1.81 | 0.082 | –2.475 | –3.30 | 0.002 |
| | (0.195) | | | (0.684) | | | (1.455) | | |
| Persistence | –2.549 | –8.94 | 0.000 | 8.220 | 3.97 | 0.000 | 8.276 | 3.74 | 0.000 |
| | (0.372) | | | (0.783) | | | (2.905) | | |
| BM | –4.243 | –3.65 | 0.000 | –0.114 | –2.18 | 0.030 | –3.30 | –4.06 | 0.000 |
| | (0.693) | | | (0.0520) | | | (0.1636) | | |
| Constant | 1.052 | 2.83 | 0.005 | –4.187 | –2.65 | 0.008 | –8.980 | –4.01 | 0.000 |
| | (0.373) | | | (1.562) | | | (1.2437) | | |
| Observations | 953 | | | 377 | | | 175 | | |
| R-squared | 0.3370 | | | 0.3012 | | | 0.5369 | | |
| Prob. > f/chi$^2$ | 0.000 | | | 0.000 | | | 0.000 | | |

Notes: This table includes the GLS random effects regression results between price as dependent variable and cashflows, normal accruals and abnormal accruals as independent variables. The regression is controlled by firm size, leverage, persistence and book to market ratio over the period 2016–2020.

**Table 8** Aggregated regression for Sub-Saharan African listed firms (share price)

| | | | | |
|---|---|---|---|---|
| Random-effects GLS regression | | | Number of obs. = 1,505 | |
| Group variable: Yr | | | Number of groups = 5 | |
| R-sq: | | | Obs per group: | |
| within = 0.3215 | | | min = 245 | |
| between = 0.3530 | | | avg = 301 | |
| overall = 0.3215 | | | max = 322 | |
| | | | Wald $chi^2(9)$ = 704.22 | |
| corr(u_i, X) = 0 (assumed) | | | Prob. > $chi^2$ = 0.0000 | |
| *Variables* | *Coefficient* | *Std. Error* | *T values* | *P values* |
| CF | *0.0154* | *0.00602* | *2.56* | *0.010* |
| NDA | *0.00659* | *0.0102* | *2.21* | *0.029* |
| DA | *–1.4926* | *1.3143* | *–1.93* | *0.054* |
| Firm size | 4.275 | 0.2607 | 19.56 | 0.000 |
| Leverage | –2.772 | 1.1485 | –2.41 | 0.016 |
| Persistence | –3.276 | 3.5356 | –3.60 | 0.000 |
| BM | –4.7567 | 0.7429 | –1.69 | 0.070 |
| East Africa | –7.0279 | 5.1720 | –13.59 | 0.000 |
| Nigeria | –7.9251 | 4.1430 | –19.13 | 0.000 |
| Constant | –6.4988 | 3.8142 | –9.54 | 0.000 |
| Max. observations | | 1,505 | | |
| Adjusted $R^2$ | | 0.3174 | | |
| Number of Yrs | | 5 | | |
| Prob. > F | | 0.0000 | | |

## *4.2 Correlation*

Pairwise Pearson correlation was used to explain the relationships. Table 6 presents the results. An increase in abnormal accruals decreases price and Tobin's Q ratio (–0.130, –0.094, –0.528, and –0.184, –0.164 and –0.192 respectively). This means that the market reacts negatively to an increase in abnormal accruals, suggesting that the market does not price abnormal accruals. Thus, the market does not value abnormal accruals positively. In all three markets, share prices increase as normal accruals and cash flows increase (0.192, 0.228, 0.526, and 0.320, 0.464, and 0.742 respectively). These results support Abdelrahim Ahmad Khader and Shareif Hussein Shanak (2023), Marquardt and Wiedman (2005) and Krishnan (2003), who argue that cash flows and normal accruals are value-relevant, while abnormal accruals, are not because of earnings management.

## *4.3 Regression tests*

Finally, an aggregated random-effects GLS regression analysis is performed using an aggregate sample of the Sub-Saharan African countries, with Nigeria and East Africa controlled for using dummy variables.

### 4.3.1 Regression using price (model 1)

Table 8 presents the aggregated results using country effects (Nigeria and East Africa). Using price as the dependent variable, we find that abnormal accruals are negatively and significantly related to share prices for all three markets ($\beta$ = –1.493, P value = 0.054). These findings indicate that abnormal accruals are a sign of earnings management in firms that impact market reputation and stock pricing (Simpson, 2021; Hossain, 2020). Thus, abnormal accruals are value-irrelevant (Akileng and Donnelly, 2013).

On the other hand, we find that normal accruals ($\beta$ = 0.0066, P value = 0.029), and cash flows ($\beta$ = 0.0154, P value = 0.010) positively significantly affect share prices. Therefore, cash flows and normal accruals are value relevant. These findings are consistent with those of Sun (2020), Kumar and Krishan (2008), Marquardt and Wiedman (2005) and Krishan (2003), which support cash flows and normal accruals as being more value relevant due to non-existent earnings management.

Table 7's individual results are similar. Abnormal accruals are negatively and significantly related to share price: South Africa ($\beta$ = –0.185, P value = 0.003), Nigeria ($\beta$ = –2.417, P value = 0.016), and East Africa ($\beta$ = –9.578, P value = 0.016). While, normal accruals [South Africa ($\beta$ = 0.0022, P value = 0.000), Nigeria ($\beta$ = 2.767, P value = 0.016), East Africa ($\beta$ = 8.776, P value = 0.029)], and cash flows [South Africa ($\beta$ = 0.0017, P value = 0.000), Nigeria ($\beta$ = 0.0003, P value = 0.000), and East Africa ($\beta$ = 0.0022, P value = 0.004)] positively significantly affect share price.

### 4.3.2 Regression using Tobin's Q (model 2)

We corroborate the findings in regression price model (1) using Tobin's Q (model 2). The findings are presented in Table 8. The results are similar when the dependent variable is the Q-ratio instead of the share price. Abnormal accruals significantly negatively affect firm value ($\beta$ = –0.805, $P$ = 0.016). Therefore, an increase in abnormal accruals negatively affects Tobin's Q (decrease in firm market value), and vice versa. These results support the regression results of price.

Normal accruals ($\beta$ = 0.00023, P value = 0.031) and cash flows ($\beta$ = 0.00013, P value = 0.004) positively and significantly affect firm market value. These findings are consistent with the findings of Abdelrahim Ahmad Khader and Shareif Hussein Shanak (2023), Sun (2020), Marquardt and Wiedman (2005) and Krishnan (2003), which highlight normal accruals as being more value-relevant than abnormal accruals. They are less susceptible to manipulation; thus, the market prefers to react.

## 4.4 Analysis of control variables

Firm size has a positive relationship with price across all regions ($\beta$ = 4.275, P value = 0.000). Therefore, markets perceive larger firms to provide credible information (Atiningsih and Izzaty, 2021). This, impacts price, firm size also has a negative relationship with Tobin's Q ratio ($\beta$ = –2.586, P-value = 0.092) across all regions. The results are supported by Gala and Julio (2016), who indicate a negative relationship between firm size and Tobin's Q. Small firms tend to have higher values of Tobin's Q compared to large firms, and thus tend to have higher investment rates.

A higher BM ratio has a negative impact on both the price [South Africa ($\beta$ = –4.757, $P$ = 0.070), and Q ratio ($\beta$ = –0.006, $P$ = 0.000)] in all regions. This relationship shows

signs of conservative accounting, known to handle earnings management which should be taken as a positive sign for investors and pricing.

Persistence negatively impacting price ($\beta$ = –3.276, P value = 0.000) and Tobin's Q ($\beta$ = –3.036, P value = 0.066). This is due to the highly competitive environment that contains the top exchange stock markets (i.e., Nigeria and South Africa) in Africa.

In all three regions, leverage negatively impacted price ($\beta$ = –2.772, $P$ = 0.016). Thus, an increase in the leverage ratio can result in lower stock prices, and all other factors are equal (Cai and Zhang, 2011). However, positively affected Tobin's Q ($\beta$ = 2.822, P value = 0.033).

**Table 9** Aggregated regression for Sub-Saharan African listed firms (Tobin's Q ratio)

| | | | | |
|---|---|---|---|---|
| Random-effects GLS regression | | | Number of obs. = 1,505 | |
| Group variable: Yr | | | Number of groups = 5 | |
| R-sq: | | | Obs per group: | |
| within = 0.0741 | | | min = 245 | |
| between = 0.4335 | | | avg = 301 | |
| overall = 0.0742 | | | max = 322 | |
| | | | Wald $chi^2(9)$ = 118.94 | |
| corr(u_i, X) = 0 (assumed) | | | Prob. > $chi^2$ = 0.0000 | |
| *Variables* | *Coefficient* | *Std. Error* | *T values* | *P values* |
| CF | *0.00013* | *0.00029* | *3.23* | *0.004* |
| NDA | *0.00023* | *0.00048* | *2.14* | *0.031* |
| DA | *–0.8054* | *0.6235* | *–2.43* | *0.016* |
| Firm size | –2.586 | 0.3525 | –1.59 | 0.092 |
| Leverage | 2.822 | 0.5448 | 2.03 | 0.033 |
| Persistence | –3.0357 | 2.1677 | –1.96 | 0.059 |
| BM | –0.006 | 0.1636 | –4.06 | 0.000 |
| East Africa | –1.392 | 3.2325 | –5.67 | 0.000 |
| Nigeria | –1.478 | 1.9653 | –7.52 | 0.000 |
| Constant | –8.98 | 1.2437 | 5.32 | 0.000 |
| Max. observations | | 1,505 | | |
| Adjusted $R^2$ | | 0.3174 | | |
| Number of Yrs | | 5 | | |
| Prob. > F | | 0.0000 | | |

## *4.5 Robustness tests*

These tests are further explained and illustrated in Tables 10, 11 and 12.

### *4.5.1 Multicollinearity*

Multicollinearity was checked using the variance inflation factor (VIF). The mean VIFs shown below are all below 10; therefore, they show no multi-collinearity.

**Table 10** Mean VIF results

| | | *Mean VIF* | |
|---|---|---|---|
| | | *Share price* | *Tobin's Q* |
| Country | South Africa | 1.24 | 1.51 |
| | Nigeria | 1.29 | 3.04 |
| | East Africa | 1.25 | 7.52 |

Note: VIF greater than 10 shows presence of multicollinearity.

### *4.5.2 Timely loss recognition*

Timeliness aids in eliminating unprofitable projects, avoiding economic losses and making sound decisions (Srivastava et al., 2015; Francis and Martin, 2010). The most frequently used measure of timely loss recognition is based on Basu (1997). If bad news is recognised on a timelier basis than good news, negative earnings changes will be less persistent and will tend to reverse more than positive earnings changes. This measure is used to check the robustness of the results.

$$Earnings_{t+1} = \propto_0 + \propto_1 D_t + \beta_0 Ret_t + \beta_1 D_t Ret_t + \varepsilon_{it}$$

$\beta_1$ is positive and higher than zero for the South and East African markets and lower than zero for Nigerian markets. South and East African firms recognise large losses more frequently (timelier) than Nigerian firms, reducing their earnings persistence. This means that the earnings in South and East Africa are of higher quality and more relevant than those in Nigeria.

**Table 11** Timeliness of earnings

| | *(S.A)* | *(Nigeria)* | *(E.A)* |
|---|---|---|---|
| *Variables* | *Earnings* | *Earnings* | *Earnings* |
| D | 0.0387 | –0.152 | 2.642 |
| | (0.501) | (0.369) | (2.101) |
| Ret | 0.197 | –0.00275 | –2.870 |
| | (0.592) | (0.00433) | (3.633) |
| DRet | 2.663** | –0.00300* | 12.49* |
| | (1.699) | (0.00534) | (7.009) |
| Constant | 3.668*** | 2.022*** | 29.64* |
| | (0.313) | (0.247) | (16.21) |
| Observations | 687 | 304 | 133 |
| Adj. R-squared | 0.290 | 0.320 | 0.360 |

Notes: If returns (Ret) < 0, and a higher positive $\beta_1$ implies more timely loss recognition due to a positive asymmetric timeliness coefficient. Standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

### *4.5.3 Modified Jones vs. Kothari model paired T. test and analytical results*

Comparisons were made between the abnormal accruals from the modified Jones model and the Kothari model using t-test and pairwise correlation. We concluded that there were no statistically significant differences. We also conducted correlation and regression GLS random-effects tests using abnormal accruals obtained using the Kothari model. Our findings are robust to, and consistent with, the findings based on abnormal accruals obtained using the Kothari model.

**Table 12** Modified Jones vs. Kothari model paired t test and correlation results

| | | *T-test (Ha: mean(diff) != 0)* | *Correlation* |
|---|---|---|---|
| Countries | South Africa | 0.9321 | 0.6832 |
| | Nigeria | 1.0000 | 1.0000 |
| | East Africa | 0.6061 | 0.9924 |

Note: The statistical significance (2-tailed p-value) of the paired t-test (Pr($|T| > |t|$) under Ha: mean(diff) != 0, is greater than 0.05 (i.e., $p > 0.05$).

## 5 Conclusions and implications of the study

The major contribution of this study is that it examines how the market reacts to and values abnormal accruals in Sub-Saharan Africa. Evidence of the value relevance of abnormal accruals remains unresolved and mixed (Barth et al., 2023). Moreover, most studies are from developed and robust markets in the US and Europe. This study provides a comprehensive analysis of the value relevance of abnormal accruals from the Sub-Saharan African capital markets. We use a comparable approach to the three markets of Nigeria, South Africa, and East Africa.

We find that abnormal accruals are value-irrelevant, and therefore, should be discounted by the market, supporting hypothesis $H_2$. These findings suggest that rational investors perceive abnormal accruals to be a less informative component of earnings. Thus, managers use abnormal accruals for opportunism (Simpson, 2021; Hossain, 2020). These findings are consistent with similar findings in the developed markets. Similarly, this finding confirms that earnings quality remains an important factor in a firm's market valuation. Thus, potential investors attach more value to quality earnings in the components of cash flow and normal accruals in their valuation of the firm.

This study is unique in that it provides evidence from less-developed financial markets with weak regulations. We contribute to market-based accounting research in Sub-Saharan Africa. We also contribute to furthering the desire to develop successful African stock markets that are robust and well-regulated. The findings of this study have implications for accounting standards setting, measurement, and recognition of earnings to improve the quality of earnings and reduce opportunist earnings management. This may imply the introduction of more stringent standards to improve the integrity of the financial reporting process (Nikman, 2023; Saccon and Dima, 2015). This calls for the strengthening of corporate governance monitoring mechanisms and systems for managers' actions (Bansal, 2024; Quasim, 2018; Laallam et al., 2017; Hsu et al., 2013). Finally, this study extends the arguments of the random walk theory, which argues that

investors' perception of firm accounting information leads to changes in prices, and thus earnings lead prices.

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## Notes

1 For financial information to be value relevant accounting figures or results should be related to current company value or else financial reports will not be able to fulfil one of their primary objectives (Barth et al., 2001).

2 This study can contribute to further research revolutions within Africa and transform the perception of academicians in market-based accounting studies. This should be a motivation for improving the quality of accounting information and the success of stock markets.

3 Louis and Robinson (2005) compare the two views on the role of discretionary accounting choices; signalling versus managerial opportunism.